CLAIMS

1. A flat plate heat exchanger which includes:

a support structure having elongate support apparatus; and

a plurality of generally flat plate members formed of a heat conductive material, and arranged for attachment to said support apparatus, so as to be supported thereby,

each said plate member including at least one support engagement portion for permitting snap coupling between said plate member and said elongate support apparatus, wherein each said support engagement portion includes at least one resilient member formed integrally with said plate member, which is arranged for flexing in a direction which is both lateral to the direction of coupling and substantially parallel to the plane of said plate member.

2. A flat plate heat exchanger according to claim 1, wherein said support apparatus has a known width, and each said support engagement portion includes:

a recess formed in a predetermined edge portion of said plate member and terminating in an opening located at said edge, wherein said recess is configured to at least partially accommodate the cross-section of said support apparatus, and

at least one lateral protrusion partially extending laterally across said recess, operative, in the absence of at least a predetermined lateral flexure force applied thereto, to prevent coupling or de-coupling of said plate member from said support apparatus.

3. A flat plate heat exchanger according to claim 2, wherein at least one of said lateral protrusions is formed on said at least one resilient member.

4. A flat plate heat exchanger according to claim 1, wherein said support apparatus has formed therein an opening of known width, and a predetermined edge portion of said plate member is configured for entry into said opening, and wherein said at least one support engagement portion is a pair of generally outward-facing lateral protrusions, the distance therebetween being greater than the width of the opening in said support apparatus, thereby, in the absence of at least a predetermined lateral flexure force, preventing coupling or de-coupling of said plate member from said support apparatus.

5. A flat plate heat exchanger according to claim 2, wherein said plate member is formed from folded sheeting, and has formed therein, adjacent to said at least one resilient member, a shaped opening which is bordered by a pair of side walls which extend at predetermined non-perpendicular angles, relative to the plane of said plate member, such that said plate members are nestable.

6. A flat plate heat exchanger according to claim 5, and also including a fixator member for insertion into said shaped opening, said locking member being configured such that, when said plurality of said plate members are arranged in a nested stack whereby said side walls of said shaped opening of each plate member are disposed within said shaped opening of an adjacent one of said plate members, insertion of said fixator member into said shaped opening of the plate member located at the end of said stack causes a lateral flexure of all of said resilient members so as to cause them to forcibly engage said support apparatus, and further, so as to cause said side walls of said shaped openings of said plate members to engage said side walls of said shaped opening of said plate member adjacent thereto.

7. A flat plate heat exchanger according to claim 2, wherein said plate member is formed from folded sheeting, and said plate member has formed therein, adjacent to said at least one resilient member, a shaped opening which is configured such that, when said plurality of plate members are arranged in a stack, said shaped opening of all said plate members are aligned in mutual registration,

wherein said heat exchanger also includes at least one locking member which is insertable transversely through said shaped openings of said stack,

and wherein said at least one locking member and said shaped openings are configured such that, insertion of said locking member into said aligned openings causes a lateral flexure of all of said resilient members so as to cause them to forcibly engage said support apparatus.

8. A flat plate heat exchanger according to claim 7, wherein said at least one resilient member includes a pair of resilient members, said at least one locking member includes a pair of locking members which are insertable transversely through said aligned shaped openings of said stack.

9. A flat plate heat exchanger according to claim 8, wherein said pair of resilient members is arranged symmetrically about said recess.

10. A flat plate heat exchanger according to claim 1, wherein said elongate support apparatus includes a pair of spaced apart generally parallel elongate support members, and each said flat plate member has a pair of generally parallel edge portions each having formed therein a single support engagement portion for coupling with a selected one of said support members,

and wherein said flat plate is configured such that, when a first of said support engagement portions is coupled with a first of said elongate support members, the other of said support engagement portions is coupled with the other of said support members so as to define therewith a space in a direction generally parallel to an axis extending between said pair of elongate support members.

11. A flat plate member for use in a flat plate heat exchanger having a stack of similar members supported in a support structure having elongate support apparatus, wherein said flat plate member includes:

a generally flat plate portion formed of a heat conductive material; and

at least one support engagement portion formed in conjunction with said flat plate for permitting snap coupling between said plate member and the elongate support apparatus, such that said flat plate member is supported thereby,

and wherein said at least one support engagement portion includes at least one resilient member arranged for flexing in a direction which is both lateral to the direction of coupling and substantially parallel to the plane of said plate member.

12. A flat plate member according to claim 11, wherein the support apparatus has a known width, and each said support engagement portion further includes:

a recess formed in a predetermined edge portion of said plate member and terminating in an opening located at said edge, wherein said recess is configured to at least partially accommodate the cross-section of the support apparatus, and

at least one lateral protrusion partially extending laterally across said recess, operative, in the absence of at least a predetermined lateral flexure force applied thereto, to prevent coupling or de-coupling of said plate member from the support apparatus.

13. A flat plate member according to claim 12, wherein at least one of said lateral protrusions is formed on said at least one resilient member.

14. A flat plate member according to claim 11, wherein the support apparatus has formed therein an opening of known width, and a predetermined edge portion of said plate member is configured for entry into said opening, and wherein said at least one support engagement portion is a pair of generally outward-facing lateral protrusions, the distance therebetween being greater than the width of the opening in the support apparatus, thereby, in the absence of at least a predetermined lateral flexure force, preventing coupling or de-coupling of said plate member from the support apparatus.

15. A flat plate member according to claim 12, wherein said flat plate portion is formed from folded sheeting, and has formed therein, adjacent to said at least one resilient member, a shaped opening which is bordered by a pair of side walls which extend at predetermined non-perpendicular angles, relative to the plane of said plate member, such that a plurality of said plate members are nestable.

16. A flat plate member according to claim 15, wherein the flat plate heat exchanger also includes a fixator member for insertion into said shaped opening, wherein said plate member is configured such that, when a plurality of said plate members are arranged in a nested stack such that said side walls of said shaped opening of each said plate member are disposed within said shaped opening of an adjacent plate member, insertion of the fixator member into said shaped opening of the plate member located at the end of the stack causes a lateral flexure of all said resilient member of each said plate member so as to cause them to forcibly engage the support apparatus, and further, so as to cause said side walls of said shaped opening of each said plate member to engage said side walls of said shaped opening of said plate member adjacent thereto.

17. A flat plate member according to claim 12, wherein said flat plate portion is formed from folded sheeting, and said plate member has formed therein, adjacent to said at least one resilient member, a shaped opening which is configured such that, when a plurality of said plate members is arranged in a stack, said shaped openings of all said plate members are aligned in mutual registration,

wherein the heat exchanger also includes at least one locking member which is insertable transversely through said shaped openings of the stack of plate members,

and wherein said shaped openings of each said plate member is configured such that, insertion of the locking member into said aligned openings causes a lateral flexure of all of said resilient members so as to cause them to forcibly engage the support apparatus.

18. A flat plate member according to claim 17, wherein said at least one resilient member includes a pair of resilient members, and wherein the heat exchange apparatus has a pair of locking members which are insertable transversely through said aligned shaped openings of said stack.

19. A flat plate heat member according to claim 18, wherein said pair of resilient members is arranged symmetrically about said recess.

20. A flat plate member according to claim 12, wherein the elongate support apparatus includes a pair of generally parallel elongate support members spaced apart along an axis, and each said flat plate member has a pair of generally parallel edge portions each having formed therein a single support engagement portion for coupling with a selected one of the support members,

and wherein said flat plate is configured such that, when a first of said support engagement portions is coupled with a first of the elongate support members, the other of said support engagement portions is coupled with the other of the support members so as to define therewith a space along said axis, thereby to accommodate thermal expansion of said flat plate member.